



Ham and Food Safety

***H**ams: They can be fresh, cook-before-eating, cooked, picnic, and country types. There are so many kinds, and their storage times and cooking times vary. This background information serves to carve up the facts and make them easier to understand.*

Definition

Hams may be fresh, cured, or cured-and-smoked. Ham is the cured leg of pork. Fresh ham is an uncured leg of pork. Fresh ham will bear the term "fresh" as part of the product name and is an indication that the product is not cured. "Turkey" ham is a ready-to-eat product made from cured thigh meat of turkey. The term "turkey ham" is always followed by the statement "cured turkey thigh meat."

The usual color for cured ham is deep rose or pink; fresh ham (which is not cured) has the pale pink or beige color of a fresh pork roast; country hams and prosciutto (which are dry cured) range from pink to a mahogany color.

Hams are either ready to eat or not. Ready-to-eat hams include prosciutto and cooked hams; they can be eaten right out of the package. Fresh hams and hams that are only treated to destroy trichinae (which may include heating, freezing, or curing in the plant) must be cooked by the consumer before eating. Hams that must be cooked will bear cooking instructions and safe handling instructions.

Hams that are not ready-to-eat, but have the appearance of ready-to-eat products, will bear a prominent statement on the principal display panel (label) indicating the product needs cooking, e.g., "cook thoroughly." In addition, the label must bear cooking directions.

Curing Solutions

Curing is the addition of salt, sodium or potassium nitrate (or saltpeter), nitrites, and sometimes sugar, seasonings, phosphates, and cure accelerators, e.g., sodium ascorbate, to pork for preservation, color development, and flavor enhancement.

Nitrate and nitrite contribute to the characteristic cured flavor and reddish-pink color of cured pork. Nitrite and salt inhibit the growth of *Clostridium botulinum*, a deadly microorganism which can occur in foods under certain situations.

Curing and flavoring solutions are added to pork by injection and by massaging and tumbling the solution into the muscle, both of which produce a more tender product.

Dry Curing

In dry curing, the process used to make country hams and prosciutto, fresh ham is rubbed with a dry-cure mixture of salt and other ingredients. Dry curing produces a salty product. In 1992, FSIS approved a trichinae treatment method that permits substituting up to half of the sodium chloride with potassium chloride to result in lower sodium levels. Since dry curing draws out

moisture, it reduces ham weight by at least 18% — but typically 20 to 25%. This results in a more concentrated ham flavor.

Dry-cured hams may be aged more than a year. Six months is the traditional process, but it may be shortened according to aging temperature.

These uncooked hams are safe stored at room temperature because they contain so little water, bacteria can't multiply in them. Dry-cured ham is not injected with a curing solution or processed by immersion in a curing solution, but it may be smoked. Today, dry cured hams may be marketed as items that need preparation on the part of the consumer to make them safe to eat. So, as with all meat products, it is important to read the label on hams to determine the proper preparation needed.

Wet Curing or Brine Cure

Brine curing is the most popular way to produce hams. It is a wet cure whereby fresh meat is injected with a curing solution before cooking. Brining ingredients can include salt, sugar, sodium nitrite, sodium nitrate, sodium erythorbate, sodium phosphate, potassium chloride, water, and flavorings. Smoke flavoring (liquid smoke) may also be injected with brine solution. Cooking *may* occur during this process.

Smoking and Smoke Flavoring

After curing, some hams are smoked. Smoking is a process by which ham is hung in a smokehouse and allowed to absorb smoke from smoldering fires, which gives added flavor and color to meat and slows the development of rancidity. Not all smoked meat is smoked from smoldering fires. A popular process is to heat the ham in a smokehouse and generate smoke from atomized smoke flavor.

Foodborne Pathogens

These foodborne pathogens (organisms in food that can cause disease) are associated with ham:

- *Trichinella spiralis* (trichinae) - Parasites that are sometimes present in hogs. All hams must be processed according to USDA guidelines to kill trichinae.
- *Staphylococcus aureus* (staph) - These bacteria are destroyed by cooking and processing, but can be re-introduced via mishandling. They can produce a toxin which is not destroyed by further cooking. Dry curing of hams may or may not destroy *S. aureus*, but the high salt content on the exterior inhibits the growth of these bacteria. When the ham is sliced, the moister interior will permit staphylococcal multiplication. Thus sliced dry-cured hams must be refrigerated.
- *Mold* - Can often be found on country cured ham. Most of these are harmless, but some molds can produce mycotoxins. Molds grow on hams during the long curing and drying process because the high salt and low temperatures do not inhibit these robust organisms. DO NOT DISCARD the ham. Scrub off the mold with a stiff vegetable brush.

Quantity to Buy

When buying a ham, estimate the size needed according to the number of servings the type of ham should yield.

- 1/4 - 1/3 lb. per serving of boneless ham
- 1/3 - 1/2 lb. of meat per serving of bone-in ham

Cooking or Reheating Hams

Both whole or half, cooked, vacuum-packaged hams packaged in federally inspected plants and canned hams can be eaten cold, right out of the package.

However, if you want to reheat these cooked hams, set the oven no lower than 325 °F and heat to an internal temperature of 140 °F as measured with a food thermometer.

For cooked hams that have been repackaged in any other location outside the processing plant or for leftover cooked ham, heat to 165 °F.

Spiral-cut cooked hams are also safe to eat cold. The unique slicing method, invented in 1957, reduces carving problems. These hams are best served cold because heating sliced whole or half hams can dry out the meat and cause the glaze to melt and run off the meat. If reheating is desired, hams that were packaged in processing plants under USDA inspection must be heated to 140 °F as measured with a food thermometer (165 °F for leftover spiral-cut hams or ham that has been repackaged in any other location outside the USDA-inspected plant). To reheat a spiral-sliced ham in a conventional oven, cover the entire ham or portion with heavy aluminum foil and heat at 325 °F for about 10 minutes per pound. Individual slices may also be warmed in a skillet or microwave.

Cook-before-eating hams or fresh hams must reach 145 °F to be safely cooked before serving. Cook in an oven set no lower than 325 °F. Hams can also be safely cooked in a microwave oven, other countertop appliances, and on the stove. Consult a cookbook for specific methods and timing.

Country hams can be soaked 4 to 12 hours or longer in the refrigerator to reduce the salt content before cooking. Then they can be cooked by boiling or baking. Follow the manufacturer's cooking instructions.

TIMETABLE FOR COOKING HAM

NOTE: Set oven temperature to 325 °F. Fresh hams should be cooked to a minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures.

Reheat cooked hams packaged in USDA-inspected plants to 140 °F and all others to 165 °F.

Note: These are approximate times for various cuts of ham:

Cut	Weight/lbs	Minutes/lb	Minimum Internal Temperature & Rest Time
SMOKED HAM, cook-before-eating			
Whole, bone in	10 to 14	18 to 20	145° and allow to rest for at least 3 minutes
Half, bone in	5 to 7	22 to 25	
Shank or Butt Portion, bone in	3 to 4	35 to 40	
Arm Picnic Shoulder, boneless	5 to 8	30 to 35	
Shoulder Roll (Butt), boneless	2 to 4	35 to 40	
SMOKED HAM, cooked			
Whole, bone in	10 to 14	15 to 18	Reheat cooked hams packaged in USDA-inspected plants to 140 °F and all others to 165 °F.
Half, bone in	5 to 7	18 to 24	
Arm Picnic Shoulder, boneless	5 to 8	25 to 30	
Canned ham, boneless	3 to 10	15 to 20	
Vacuum packed, boneless	6 to 12	10 to 15	
Spiral cut, whole or half	7 to 9	10 to 18	
FRESH HAM, uncooked			
Whole leg, bone in	12 to 16	22 to 26	145° and allow to rest for at least 3 minutes
Whole leg, boneless	10 to 14	24 to 28	
Half, bone in	5 to 8	35 to 40	
COUNTRY HAM			
Whole or Half. (Soak 4 to 12 hours in refrigerator. Cover with water and boil 20 to 25 minutes per pound. Drain, glaze, and brown at 400 °F for 15 minutes.			

HAM STORAGE CHART

NOTE: Freezer storage is for quality only. Frozen hams remain safe indefinitely.

Type of Ham	Refrigerate	Freeze
Fresh (uncured) Ham, uncooked	3 to 5 days	6 months
Fresh (uncured) Ham, cooked	3 to 4 days	3 to 4 months
Cured Ham, cook-before-eating; uncooked	5 to 7 days or "use-by" date*	3 to 4 months
Cured Ham, cook-before-eating; after consumer cooks it	3 to 5 days	1 to 2 months
Cooked Ham, vacuum sealed at plant, <i>undated</i> ; unopened	2 weeks	1 to 2 months
Cooked Ham, vacuum sealed at plant, <i>dated</i> ; unopened	"Use-by" date*	1 to 2 months
Cooked Ham, vacuum sealed at plant, undated or dated; <i>opened</i>	3 to 5 days	1 to 2 months
Cooked Ham, whole, store wrapped	7 days	1 to 2 months
Cooked Ham, half, store wrapped	3 to 5 days	1 to 2 months
Cooked Ham, slices, store wrapped	3 to 5 days	1 to 2 months
Spiral-cut hams and leftovers from consumer-cooked hams	3 to 5 days	1 to 2 months
**Country Ham, uncooked, cut	2 to 3 months	1 month
Country Ham, cooked	7 days	1 month
Canned Ham, labeled "Keep Refrigerated," unopened	6 to 9 months	Do not freeze
Canned Ham, labeled "Keep Refrigerated," <i>opened</i>	7 days	1 to 2 months
***Canned Ham, shelf stable, opened	3 to 4 days	1 to 2 months
Lunch Meat Ham, sealed at plant, unopened	2 weeks or "use-by" date*	1 to 2 months
Lunch Meat Ham, sealed at plant, <i>after opening</i>	3 to 5 days	1 to 2 months
Lunch Meat Ham, sliced in store	3 to 5 days	1 to 2 months
Prosciutto, Parma or Serrano Ham, dry Italian or Spanish type, cut	2 to 3 months	1 month

*Company determines its "use-by" date and stands by it.

** A whole, uncut country ham can be stored safely at room temperature for up to 1 year. The ham is safe after 1 year, but the quality may suffer.

*** An unopened shelf-stable, canned ham may be stored at room temperature for 2 years.

HAM GLOSSARY

CANNED HAM: “Canned Meat with Natural Juices” is acceptable for product that has been pumped or contains up to 10% of a solution before canning and processing. Processed, canned, uncured meat products, (when water or broth is added to the can) may not be called “with natural juices.” The acceptable name would be “with juices.” Canned hams come in two forms:

- Shelf stable - Can be stored on the shelf up to 2 years at room temperature. Generally not over 3 pounds in size. Processed to kill all spoilage bacteria and pathogenic organisms such as *Clostridium botulinum*, *Salmonella*, and *Trichinella spiralis*. The product is free of microorganisms capable of growing at ordinary room temperature. However, high temperature storage — above 122 °F (50 °C) — may result in harmless thermophilic bacteria multiplying and swelling or souring the product.
- Refrigerated - May be stored in the refrigerator for up to 6 to 9 months. Its weight can be up to 8% more than original uncured weight due to the uptake of water during curing. It need not be labeled “Added water” except for “In Natural Juices.” Net weight is the weight of the actual ham excluding the container. Processed at a cook time and temperature sufficient to kill infectious organisms (including Trichinae); however, the ham is not sterilized so spoilage bacteria may grow eventually.

CAPACOLLO, COOKED (Capicola, Capocollo, Capicola, Capicollo, Cappicola, Capacolo — Italian): This product does not meet the definition of ham because it is not from the hind leg of a hog. It is boneless pork shoulder butts which are cured and then cooked. The curing process may be dry curing, immersion curing, or pump curing. The cured product is coated with spices and paprika before cooking. This product shall always be labeled with “Cooked” as part of the product name. Water added is permitted.

CAPACOLLA, HAM, COOKED: Ham that has been cured and then cooked.

COOK BEFORE EATING: Needs cooking or further cooking. Is not cooked in the plant or heat treated in the plant and should be cooked to a safe minimum internal temperature of 145 °F as measured with a food thermometer before removing meat from the heat source. For safety and quality, allow meat to rest for at least three minutes before carving or consuming. For reasons of personal preference, consumers may choose to cook meat to higher temperatures. Cook in an oven set no lower than 325 °F.

COTTAGE “HAM”: Smaller pieces of boneless cured ham usually formed into a roundish shape of a softball size or larger form. It is heated or cooked so that it is ready to cook in the home or ready to eat.

COUNTRY HAM, COUNTRY STYLE HAM, or DRY CURED HAM, and COUNTRY PORK SHOULDER, COUNTRY STYLE PORK SHOULDER, or DRY CURED PORK SHOULDER: The uncooked, cured, dried, smoked or unsmoked meat food products made respectively from a single piece of meat conforming to the definition of “ham” or from a single piece of meat from a pork shoulder. They are prepared by the dry application of salt or by salt and one or more optional ingredients; e.g., nutritive sweeteners, spices, seasonings, flavorings, sodium or potassium nitrate, and sodium or potassium nitrite. They may not be injected with curing solutions nor placed in curing solutions. The product must be treated for the destruction of possible live trichinae.

FULLY COOKED or COOKED: Needs no further cooking because it is fully cooked at the establishment where it was produced and packaged. Product can be eaten right out of the package or reheated. Fully cooked is synonymous with cooked.

GELATIN: Gelatin is a binder/extender and is only permitted in a few meat and poultry products like sausage, luncheon meat, and meat loaves. About 1/4 ounce of dry gelatin is often added before a canned ham is sealed to cushion the ham during shipment. During processing, natural juices cook out of the ham and combine with the gelatin. When the ham cools, a jelly forms. Gelatin is included in the net weight statement on the label and its presence is also qualified in the product name; e.g., “Canned Ham, Gelatin Added.”

HALF HAM: “Half Ham” is permitted on labels for semi-boneless ham products which have had the shank muscles removed during processing. The two halves of the finished product have approximately an equal amount of bone. The term “No Slices Removed” has also been deemed suitable for use with a ham item referred to as “Half Ham.”

HAM: Cured leg of pork. In order to be labeled as “Ham,” the product must be at least 20.5% protein in lean portion as described in 9 CFR 319.104. Added water is permitted in a product labeled as “Ham.” In fact, water will be declared in order of predominance in the ingredients statement. This is how the cure solution is introduced into a ham.

HAM AND WATER PRODUCTS X% of Weight is Added Ingredients: Product contains more additives than a "Ham Water Added," but the product name must indicate percent of "added ingredients." For example, "Ham and Water Product 25% of Weight is Added Ingredients" for any canned ham with less than 17.0% protein.

HAM, BOILED: A fully cooked, boneless product which must be cooked in water and may be processed in a casing or can. The product may be of various shapes and may be partially cooked in boiling water.

HAM, FRESH (or uncured): The uncured leg of pork. Since the meat is not cured or smoked, it has the flavor of a fresh pork loin roast or pork chops. Its raw color is pinkish red and after cooking, grayish white. Ham that does not contain a cure must be labeled "Fresh." This also applies to cooked product, "Cooked Uncured Ham."

HAM SALAD: Product must contain at least 35% cooked ham. Chopped ham may be used without it appearing in the product name.

HAM, SCOTCH STYLE: A cured, uncooked, boned, and rolled whole ham either tied or in a casing.

HAM SHANK END, HAM SHANK HALF, or HAM SHANK PORTION: The lower, slightly pointed part of the leg. A "portion" has the center slices removed for separate sale as "ham steaks." A half ham does not have slices removed.

HAM, SKINLESS, SHANKLESS: A ham with all of the skin and the shank removed. The leg bone and aitch (hip) bone remain.

HAM, SMITHFIELD: This is an aged, dry-cured ham made exclusively in Smithfield, Virginia. The use of the words "brand" or "style," e.g., "Smithfield Brand Ham," "Smithfield Style Ham," does not eliminate this requirement.

HAM STEAK: Another name for ham slices.

HAM — WATER ADDED: The product is at least 17.0% protein with 10% added solution.

HAM with NATURAL JUICES: The product is at least 18.5% protein.

HICKORY-SMOKED HAM: A cured ham which has been smoked by hanging over burning hickory wood chips in a smokehouse. May not be labeled "hickory smoked" unless hickory wood has been used. Atomized liquid hickory smoke and heat can combine to produce "hickory smoke."

HONEY-CURED: May be shown on the labeling of a cured product if (1) the honey used contains at least 80% solids or is U.S. grade C or above; (2) honey is the only sweetening ingredient or when other sweetening ingredients are used in combination with honey, they do not exceed 1/2 the amount of honey used; and (3) honey is used in an amount sufficient to flavor and/or affect the appearance of the finished product.

"LEAN" HAM: The term "lean" may be used on a ham's label provided the product contains less than 10 grams fat, 4.5 grams or less of saturated fat, and less than 95 milligrams cholesterol per 100 grams and Reference Amount Customarily Consumed (RACC).

"EXTRA LEAN" HAM: A ham labeled "extra lean" must contain less than 5 grams fat, less than 2 grams saturated fat, and the same cholesterol as allowed per the amount of "lean" ham.

PORK SHOULDER PICNIC: A front shoulder cut of pork. The term "picnic" cannot be used unless accompanied with the primal or subprimal cut. Pork shoulder picnic is not always a cured item. A shoulder "picnic" comes from the lower portion of the shoulder.

PROSCIUTTO: Italian for ham, dry cured. The product name "Prosciutto" is acceptable on labeling to identify a dry-cured ham. An Italian-style dry cured raw ham; not smoked; often coated with pepper. Prosciutto can be eaten raw because the low water content prevents bacterial growth.

PARMA HAM is prosciutto from the Parma locale in Italy. These hams tend to be larger than the U.S. produced product, as Italian hogs are larger at slaughter.

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PROSCIUTTO, COOKED: The product name "Cooked Prosciutto" is acceptable on labeling to identify a Prosciutto that is cooked.

SECTIONED AND FORMED HAM or **CHUNKED AND FORMED HAM:** A boneless ham that is made from different cuts, tumbled or massaged and reassembled into a casing or mold and cooked. During this process it is usually thoroughly defatted. The qualifying phrase "sectioned and formed" is no longer required on boneless ham products, e.g., "ham" and "ham-water added." The addition of small amounts of ground ham added as a binder to such products may be used without declaration. The amount of ground ham that may be used can represent no more than 15% of the weight of the ham ingredients at the time of formulation. Products containing more than 15% ground ham trimmings must be labeled to indicate the presence of the ground ham; e.g., "a portion of ground ham added."

SUGAR CURED: May be used on the labeling of a cured product (1) if the sugar used is cane sugar or beet sugar; (2) sugar is the only sweetening ingredient or when other sweetening ingredients are used in combination with sugar, they do not exceed one-half the amount of sugar used; and (3) sugar is used in an amount sufficient to flavor and/or affect the appearance of the finished product.

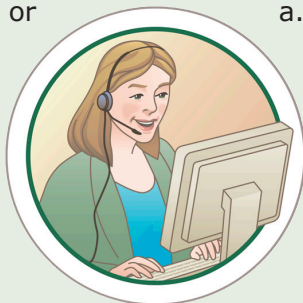
WESTPHALIAN HAM: A German-style dry cured ham that is similar to Prosciutto; smoked, sometimes made with juniper berries.

NOTE: Most of the definitions in this glossary are from the FSIS "Food Standards and Labeling Policy Book." To access this book, go to: www.fsis.usda.gov/OPPDE/larc/Policies/Labeling_Policy_Book_082005.pdf (PDF only).

Food Safety Questions?

Call the USDA Meat & Poultry Hotline

If you have a question about meat, poultry, or egg products, call the USDA Meat and Poultry Hotline toll free at **1-888-MPHotline (1-888-674-6854)**. The hotline is open year-round.



Monday through Friday from 10 a.m. to 4 p.m. ET (English or Spanish). Recorded food safety messages are available 24 hours a day. Check out the FSIS Web site at

www.fsis.usda.gov.

Send E-mail questions to **MPHotline.fsis@usda.gov**.

AskKaren.gov

FSIS' automated response system can provide food safety information 24/7 and a live chat during Hotline hours.



Mobile phone users can access **m.askkaren.gov**

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